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Original Article

Cervical cancer screening in Minas Gerais women from 2012 – 2015

Rastreamento do câncer de colo de útero em mulheres mineiras de 2012 - 2015

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Abstract

Objective: to analyze the results of the LSIL and HSIL screening from July 2012 to July 2015. **Materials and Methods:** descriptive study based on secondary data from SISCOLO. **Results:** In the period from June 2012 to July 2015, 2,451,607 cytopathological exams were performed in Minas Gerais, with 743,276, 2013 1,099,876 and 2014 608,455 in women aged 10 to over 64 years. Where, there is a deficit in data collection. The main cities that had the highest number of positive cases for LSIL and HSIL, we have Belo Horizonte, Juiz de Fora, Montes Claros and Uberlândia, in both injuries, Belo Horizonte has the highest number of positive cases. **Conclusion:** there is a common age group between 25 and 34 years old with a high involvement of LSIL and HSIL.

Keywords: Cancer. Cervix uteri. Intraepithelial lesion. LSIL. HSIL.

Resumo

Objetivo: analisar os resultados do rastreamento de LSIL e HSIL no período de julho de 2012 a julho de 2015. **Materiais e Métodos:** estudo descritivo com base em dados secundários do SISCOLO. **Resultados:** foram realizados, no período de junho de 2012 a julho de 2015, 2.451.607 exames citopatológicos em Minas Gerais, sendo, em 2012, 743.276; 2013, 1.099.876 e 2014, 608.455 em mulheres de 10 a mais de 64 anos, em que se observa um déficit no levantamento de dados. As principais cidades em que ocorreu o maior número de casos positivos para LSIL e HSIL foram Belo Horizonte, Juiz de Fora, Montes Claros e Uberlândia. Em ambas as lesões, Belo Horizonte é a que possui a maior quantidade de casos positivos. **Conclusão:** há uma faixa etária em comum, 25 a 34 anos, com alto acometimento de LSIL e HSIL.

Palavras-chave: Câncer. Colo de útero. Lesão intraepitelial. LSIL. HSIL.

INTRODUCTION

According to the National Cancer Institute (INCA), cancer is the disordered growth of cells that can affect tissues and organs. They spread rapidly, becoming aggressive and uncontrollable, generating tumors, malignant neoplasms that can spread to other regions of the body (metastasis)[1].

Cervical cancer (CCU) is a global health problem, affecting women all over the world. It is the fourth most common cancer, with 80% of new cases occurring in developing countries[2].

Cervical cancer (CCU), when diagnosed early, is curable, because it is a neoplasm with a precursor lesion that may or may not evolve into a carcinoma in a period of 10 to 20 years. For tracking and evaluating this pathology, a low-cost and easy-to-perform Pap test, the Pap smear examination or also called cervical cytopathological exam, is performed[3,4].

According to the Ministry of Health, although there are increasing efforts for early diagnosis and screening of cervical cancer, the Brazilian society has factors strongly associated with the worsening of this cancer, especially sedentary lifestyle, obesity, smoking, and poor diet (high-fat and industrialized).

The main strategy to reveal the existence of precursor lesions and diagnose cervical cancer early or not is the cervical cytopathological exam, which, because it is simple and easy to perform, can be done in primary health care centers that have trained professionals[5].

In Brazil, cervical cancer is the third most incident neoplasm, with high rates in the south and southeast, the most populated and industrialized regions of the country, while the north and northeast have lower rates[6].

The Ministry of Health determines that cytopathological screening should be done every three years in women aged 25 to 64 years old, when she has had two tests with negative results annually. In developed countries, there is constant recruitment of women for cervical cancer screening; however, in Brazil, screening is still ductile, in other words., the demand is occasional and spontaneous; and opportunistic screening hinders the work of the health system in relation to the impacts on mortality[1,7,8].

About 30% of the Brazilian female population aged 25 to 69 years old perform the cytopathological exam annually. This is not so effective, since a good coverage for screening would be 80%, according to the World Health Organization[2].

According to INCA[3], as a national priority, the control of cervical cancer (CCU) has several actions; among them, the Ministry of Health highlighted in 1998, the National Program to Combat Cervical Cancer and the creation of the Cervical Cancer Information System (SISCOLO). The SISCOLO was implemented in the country with the objective of managing and making possible actions related to CCU tracking. This process took place on July 30th, 1999, with the Ordinance/SAS/MS no. 408. On April 24, 2006, the Ordinance /SAS/MS no. 287 improved the system, with the implementation of a new version, version (4.0).

The National Policy for Oncological Care was instituted in 2005 and, in 2006, the Health Pact Program, aiming to achieve greater efficiency among the Union, states, and municipalities, reaffirmed the importance of early detection of CCU[3].

Characterized by its large extension and regional diversity, the state of Minas Gerais is considered a representation of the Brazilian regional structure, with the southern region as the most developed and the northern and northeastern regions as the least developed[9].

Thus, it is relevant to evaluate the screening of positive results of High-Grade Intraepithelial Lesion (HSIL) and Low-Grade Intraepithelial Lesion (LSIL), indicators of CCU, identifying the most affected ages. With the database of SSISCOLO in Minas Gerais, its macro and micro regions, this study aims to evaluate the effectiveness of screening for LSIL and HSIL in Minas Gerais women.

MATERIALS AND METHODS

This was a descriptive study in which the SISCOLO data from 2012 to 2015 were used, analyzing the indicators in Minas Gerais and in the health macro-regions. Minas Gerais has 853 municipalities, being divided into 66 micro-regions and having 12 health macro-regions, characterized by great socioeconomic disparity.

The data were extracted from SISCOLO through the website of the Department of Informatics of the Unified Health System (DATASUS), in May 2020. Minas Gerais women aged 10 to over 64 years old were evaluated, and the involvement in the macro-regions.

The raw data were analyzed descriptively in Microsoft Excel and Word 2016 programs.

This study is part of a research project, which aimed to analyze the results of LSIL and HSIL screening from July 2012 to July 2015.

RESULTS

According to the last IBGE[10] census, the female population in the state of Minas Gerais is 8,625,304 women in the ages 10 to over 100. The most found ages, according to the subgroups determined by IBGE, are women between 20-24, 25-29, 15-19, 10-14, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59 and 60-64 years old.

From June 2012 to July 2015, 2,451,607 cytopathological exams were performed in Minas Gerais; being in 2012, 743,276; in 2013, 1,099,876 and in 2014, 608,455, in women over 10 years of age.

In the period analyzed, a deficit in data collection is observed, in other words, the months of February, June, September and October 2014 and the year 2015 have no registered data. It can be observed that the year 2013 was the only year that has no interruptions in the registration of data, thus being the year with greater adherence and performance of cytopathological tests.

Low-grade squamous intraepithelial lesion comprises the cytopathic effect by *Human Papilloma Virus* (HPV) and Cervical Intraepithelial Neoplasia grade 1. High grade squamous intraepithelial lesion (HSIL) comprises Cervical Intraepithelial Neoplasia grades II and III and carcinoma "in situ". They can progress, when untreated, to invasive cancer.

According to Table 1, the age group that performed the most exams was women aged 30-49, in other words, those who generally have an active sex life and seek annual prevention. Then there are women aged 25-29, 50-54, and 20-24, meaning, those who are in the beginning or end of their sexual life, since there is a clear reduction in the number of women under the age of 20 and over the age of 54 who have had the exam.

Table 1 - Number of exams per year of competence, according to age group. Minas Gerais, Brazil. 2021.

Age group (in years)	2012	2013	2014	Total
Up to 11	194	229	87	510
12 to14	1,547	2,123	989	4,659
15 to19	35,677	50,396	27,096	113,169
20 to 24	67,514	94,395	50,492	212,401
25 to 29	81,203	115,000	61,644	257,847
30 to 34	90,558	131,829	70,973	293,360
35 to 39	85,239	127,059	70,859	283,157
40 to 44	86,302	127,874	69,630	283,806
45 to 49	83,793	125,734	69,006	278,533
50 to 54	73,794	113,185	64,324	251,303
55 to 59	58,221	89,535	52,311	200,067
60 to 64	38,157	60,319	36,483	134,959
Over 64	41,077	62,198	34,561	137,836
Total	743,276	1,099,876	608,455	2,451,607

Source: Cervical Cancer Information System (SISCOLO).

In Table 2, the positive tests for LSIL are presented, with satisfactory sample grade, in which women aged 15-29 years old are presented with a higher incidence of low-grade squamous intraepithelial lesion, which is most often caused by HPV and appears with the onset of sexual life.

Table 2 - Low-grade Intraepithelial Lesion by Age Group and Year of Competence. Minas Gerais, Brazil. 2021.

Age group (in years)	2012	2013	2014	Total
Up to11	1	2	1	4
12 to 14	58	62	27	147
15 to 19	876	1234	658	2768
20 to 24	1124	1477	817	3418
25 to 29	995	1370	699	3064
30 to 34	881	1187	641	2709
35 to 39	643	927	479	2049
40 to 44	577	724	411	1712
45 to 49	422	593	309	1324
50 to 54	263	392	214	869
55 to 59	163	230	124	517
60 to 64	102	122	77	301
Over 64	128	132	77	337
Total	6233	8452	4534	19219

Source: Cervical Cancer Information System (SISCOLO).

Table 3 shows the positive tests with satisfactory samples for HSIL, with the most affected age group being 25-39 years old, in a population that has an active sex life.

Table 3 - High-grade Intraepithelial Lesion by Age Group and Year of Competence. Minas Gerais, Brazil. 2021.

Age Group (in years)	2012	2013	2014	Total
12 to 14	-	3	1	4
15 to 19	33	61	36	130
20 to 24	102	160	133	395
25 to29	195	284	195	674
30 to 34	214	359	263	836
35 to 39	167	327	240	734
40 to 44	125	264	204	593
45 to 49	135	198	178	511
50 to 54	105	193	110	408
55 to 59	86	149	116	351
60 to 64	53	116	88	257
Over 64	107	147	78	332
Total	1322	2261	1642	5225

Source: Cervical Cancer Information System (SISCOLO).

When analyzing the main cities where the highest number of positive cases for LSIL and HSIL occurred, we have Belo Horizonte, Juiz de Fora, Montes Claros, and Uberlândia, for both lesions; Belo Horizonte has the highest number of positive cases.

DISCUSSION

According to the Ministry of Health1, to have a good coverage of cytopathological exams for cervical cancer screening, about 80% of women should undergo prevention annually. This fact cannot be observed in Minas Gerais in the period analyzed, since the coverage was 28.42%, adding the three years. 2012 showed a coverage of 8.61%, with a higher number in 2013, 12.75% of the population, and in 2014, the lowest coverage observed during the period analyzed, 7.05%.

In a study carried out in Rio Branco, women aged 25 to 50 years old, married or in a stable union, with higher education, working outside the home, and physically active, showed a higher prevalence regarding the performance of cytopathological exams, which can be confirmed by looking at table 1, in which the total number of exams performed per age group in Minas Gerais are presented[11].

A study carried out at the Dilson Godinho Hospital in the city of Montes Claros shows that 33.8% of the patients diagnosed with cervical cancer did not know the importance of the preventive exam, which can justify the low rate of adherence to the cytopathological exam[12].

Even being among the first four places of positive exams for LSIL and HSIL, a study conducted in 2008 in the city of Montes Claros showed that 71.1% of women did not perform the prevention exam; of these, 84.4% had a maximum of 8 years of schooling, with a monthly income of up to R$ 600.00[13].

Still on the low adherence to preventive exams, the main reasons identified were the availability of time

off work, presented by younger women, and the physical limitations of older women[14].

Other factors that lead to not doing the preventive exam are fear, embarrassment, lack of knowledge about its importance, the fact that they do not present signs and symptoms and are not sick, besides this, the culture based on the model of curative medicine, i.e., seeking professional help only when a picture with symptoms is presented[13,15].

According to table 2, LSIL is more frequent in women aged 15 to 34 years old, who are at the beginning of their sexual life and at the fertile age, according to Syrjanen et al. (2005)[16] who state that most women with positive LSIL are younger than 30 years old.

Every HPV is LSIL, but not every LSIL is an HPV, so it is important to know that the human papilloma virus is a DNA virus with more than 200 types described and are grouped by their oncogenic ability and is responsible for most cases of CCU. Highlighting the subtypes 6 and 11, they are of low oncogenic power, related to genital condylomas, and the 16 and 18 of high oncogenic power, responsible for 70% of all cervical cancers[8,17].

The transmission of HPV occurs in the sexual, maternal-fetal or contact forms along the different transmission routes, and most of the manifestations of the infection are asymptomatic, making the diagnosis of HPV difficult[18].

HPV can affect men and women affecting the genital and extragenital region, and may manifest in clinical, subclinical, and latent forms. The subclinical and asymptomatic forms predominate among men, who are considered the spreaders of the disease, however, the prevalence of infection occurs in women and can spontaneously regress in 90% of cases. However, factors such as immunological status, smoking, genetic inheritance, sexual habits, and prolonged use of oral contraceptives will determine the continuity of the infection and may lead to progression to intraepithelial lesions[19-21].

Among the risk factors for genital HPV are: age under 25 years old, early sexual life, and number of sexual partners. Thus, it is suggested that the number of sexual partners is a relevant element for genital HPV infection[22]. In this sense, Muñoz *et al.* (2007)[23] concluded that sexual partners of women studied with cervical cancer had genital infections, including warts, as well as penis cancer.

The *Food and Drug Administration* (FDA), in June 2006, approved the quadrivalent vaccine. Since then, some countries have used the strategy of applying it in adolescents as a form of primary or therapeutic prophylaxis related to HPV, which could induce regression of precursor lesions and cancer remission. The prophylactic vaccines currently available are of two types: the bivalent, Cervarix®, with viral coverage to serotypes 16 and 18, of high oncogenic power; and the quadrivalent, Gardasil®, with viral coverage to types 6, 11, 16 and 18, of low and high oncogenic power. There is no prophylaxis for the other subtypes[24].

The HPV vaccine is in three doses. After the vaccines are finished, antibody levels tend to drop for two years until they reach a plateau. The vaccine, being highly immunogenic, stimulates the body to produce genotype-specific antibodies in large quantities, up to ten times more than the number of antibodies produced in naturally acquired infection.

The course of an already installed infection was not altered by the vaccine, but it protects the individual who has not yet been exposed to the most common subtypes. Consequently, it is understood that eradication of the most common subtypes (6, 11, 16, and 18) is possible with vaccination of the population not exposed

to these subtypes[25]. However, there may be a potentiation of the less frequent subtypes. In countries that have implemented vaccination, a reduction in CCU incidence and mortality has not yet occurred. However, the vaccine is considered a promising alternative to reduce morbidity and mortality from cervical cancer[26-28].

Based on table 3, it can be stated that the age range most affected by HSIL is 25 to 44 years old. The studies state that these are brown women, with a low level of education and with a greater number of sexual partners, besides presenting early menarche, being multiparous and with smoking habits[29-31].

The present study allowed the identification of the age groups and cities in Minas Gerais with the highest rates of positivity for LSIL and HSIL related to cervical cancer, as well as the knowledge of some of the causes of non-adherence to the prevention exam.

CONCLUSION

It was observed that the age group 25 to 34 years old has a high incidence of LSIL and HSIL. Furthermore, more intense awareness policies are needed regarding the importance of the prevention exam in the state of Minas Gerais, since the years analyzed together are equivalent to 28.42%, which is a much lower value than that determined by the Ministry of Health and an update of the SISCAM data, since there are missing months of the years 2014 and 2015 and, as of August 2015, no months or data are presented for consultation.

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